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TABLE II.—SHOWING PROPORTION OF AMMONIA AND NITRIC ACID IN SOME RAINS.

LITRES PER ACRE.	PARTS PER MILLION.	
	<i>Ammonia.</i>	<i>Nitric acid.</i>
850	14.50	4.84
10,075	4.30	7.04
1,750	12.60	8.33
3,500	9.10	2.56
7,973	9.10	2.71
9,750	4.35	3.30
3,900	6.10	2.82
925	2.85	3.95
28,200	.04	.51
312,730	.07	.51
121,900	.00	.38
112,500	.04	.64
206,250	.19	.38
26,925	.26	.16
10,750	.27	.25
62,250	.69	.13

ADDITIONS TO KANSAS BIRDS.

BY COL. N. S. GOSS, TOPEKA.

Frosted Poor-will, *Phalacroptilus nuttalli nitidus*. A summer resident. Taken at Neosho Falls and Manhattan.

Little Brown Crane, *Grus canadensis*. This bird was omitted by oversight from the catalogues, and subsequent lists as reported to this society. It is not uncommon during migration.

OCTOBER, 1889.

ARTESIAN WELLS IN KANSAS, AND THE CAUSES OF THEIR FLOW.

BY ROBERT HAY, F.G.S.A., JUNCTION CITY.

[Abstract.]

This paper mentions twelve localities where there are artesian wells in Kansas. The Larned well has the largest flow—nearly three hundred gallons per minute—and gives out a strong brine. There is a group of wells in Hamilton county, and another group in Meade county, available for irrigation.

The principal feature in the paper is the discussion of the causes of artesian flow. The conditions resulting in the usual form of artesian wells, which are exemplified by those mentioned above, are a porous rock, having an out-crop to catch the rainfall of a region of some extent, and dipping toward the well with a layer of clay, clay-shale, or other impervious material, above and below it, so that the water of the porous stratum is inclosed as in a pipe, and it rises to the surface when the well-driller pierces the upper impervious stratum. The cause of the rising of the water in these conditions is *hydrostatic pressure*, just as it is in the rising of the water to the tops of high buildings in the water service of a city.

A well at Mound Valley, in Labette county, was described as illustrating the rise of water to the surface without the necessary hydrostatic pressure, the column of water being held up by an outflow of natural gas. This the writer termed *gas-pressure*, which in this case is an efficient cause of artesian flow, and which in other cases is probably a help.

Wells in Morton county and in Pottawatomie county were described, having